

Application No.: 09/889,269
Attorney Docket No.: FUK-84
Amendment Dated: March 9, 2005
Reply for Final Office Action Dated: February 9, 2004

REMARKS

Claims 1 and 2 are pending in the application. Claims 3 and 4 have been previously cancelled.

Claim 1 has been cancelled herein. Claims 5-12 have been newly added herein. Claim 2 has been amended. Support for the claim amendments and new claims may be found in the substitute specification filed July 13, 2001, at Page 6, lines 3-11, and Page 8, lines 3-9, for example.

In brief, one form of the invention is directed to a product including a chromium-oxide deposit formed on a metallic material surface. The metallic material surface (upon which the chromium-oxide deposit lies) has a surface roughness (Ra) that is not more than 1.5 μ m. In one particular form, the product includes an oxidized chromium coat that is deposited on the metallic material surface.

In particular, according to one form of the invention, a final product includes a metallic body having a surface with a roughness (Ra) that is not more than 1.5 μ m. The final product further includes an oxidized chromium coat that is deposited on the metallic body. Thus, the deposit of oxidized chromium lies on the metallic body surface which has the roughness (Ra) being not more than 1.5 μ m. The final product, then, includes an oxidized chromium coat deposit that is formed on the metallic body surface. It is seen from this structural arrangement that the metallic body surface having the roughness (Ra) being not more than 1.5 μ m lies between the oxidized chromium coat deposit and the metallic body, and thereby serves as the interface therebetween. This feature is advantageous because it promotes adherence, as recognized by the inventors. (Page 6, lines 3-11; Page 9, line 16 to Page 10, line 2). The oxidized chromium coat deposit serves as a chromium-oxide passivation film.

Referring to the claims, Applicant respectfully submits that the chromium-oxide deposit of the invention is not met by the Beilby work strain layer of Ohmi. In particular, the chromium oxide layer of Ohmi does not correspond structurally to the chromium-oxide deposit of the invention. In Ohmi, generally, there is no teaching or suggestion of any chromium deposit relative to the steel base, and

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therefore no disclosure of an oxidized chromium deposit. More specifically, the work strain layer of Ohmi does not constitute a chromium deposit relative to the steel base.

Additionally, Applicant respectfully submits that Ohmi does not teach the limitation relating to the structural arrangement of the chromium-oxide deposit and the metallic material, as it pertains to the relative location of the metallic material surface which has a roughness (Ra) that is not more than $1.5\mu\text{m}$. As set forth in the claims, the chromium-oxide deposit is formed on the metallic material surface having the specified roughness. As such, it is seen that the final product of the invention exhibits a structural feature where the metallic material surface having the roughness (Ra) being not more than $1.5\mu\text{m}$ lies interposed between the chromium-oxide deposit and the metallic material body. In this fashion, the metallic material surface having the indicated roughness serves as the boundary or interface between the chromium-oxide deposit and the metallic body.

However, in Ohmi, the surface referenced by the Examiner in regard to this surface roughness claim limitation corresponds to the outermost surface of the overall structure, namely, the exposed outer surface of the chromium oxide work strain layer. (Col. 3, line 65 to Col. 4, line 5; Col. 6, lines 49-55). In Ohmi, generally, the characteristic of surface roughness (for purposes of comparison to the claims) applies only to the outermost surface of the end product, not to an intermediate surface that serves as the boundary or interface between the chromium-oxide deposit and metallic body, as in the invention.

Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,656,099 to Ohmi.

In view of the cancellation of Claim 1, Applicant believes that this rejection is now moot. However, in view of the foregoing, Applicant respectfully submits that newly added Claims 5-12 are patentable over Ohmi.

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Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,248,676 to Uchida et al. (hereinafter "Uchida") in view of Ohmi.

In view of the cancellation of Claim 1, Applicant believes that this rejection is now moot. However, Applicant respectfully submits that amended Claim 2 and newly added Claims 5-12 are patentable over Uchida in view of Ohmi, for the reasons below.

The Examiner states in the Final Office Action that it would be "obvious to one of ordinary skill in the art to use a chromium oxide as the passivation film in Uchida as taught by Ohmi because of the improved corrosion resistance gained by layer consisting only of chromium oxide." Referring to Uchida, the modification proposed by the Examiner would involve the oxidation of metallic chromium layer 2 disposed on steel plate 1. (Fig. 1).

However, for the reasons below, Applicant submits that the modification proposed by the Examiner would not be obvious, since Uchida expressly aims to avoid the exact modification proposed by the Examiner, and hence teaches away from the combination proposed by the Examiner.

Uchida variously describes the disadvantages of a chromate film 3 disposed directly on steel plate 1. (Col. 2, lines 15-53; Col. 3, lines 10-27). Notably, Uchida disapproves of structural arrangements where the chromate film 3 - perhaps including chromium oxide - is deposited on the steel. (Col. 2, lines 39-45; Col. 4, lines 25-33). Uchida notes the unsuitability of such an arrangement and instead forms a structure where a metallic chromium layer 2 is interposed between the steel base 1 and outermost chromate layer 3. (Fig. 1). The strictly chromium composition of intermediate layer 2 is an essential part of the Uchida structure.

In view of the disclosures made by Uchida concerning the disadvantages of placing a chromate film 3 (e.g., an oxide) directly on steel plate 1, and the consequent object of Uchida to overcome such disadvantages by placing a strictly chromium layer 2 between chromate film 3 and steel plate 1, one

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skilled in the art would not consider it to be obvious to make the modification proposed by the Examiner, i.e., oxidation of layer 2. Rather, it is considered that one skilled in the art would perceive that Uchida teaches away from such a modification, or at least provides a sufficient disincentive so that one skilled in the art would not consider the modification to be obvious.

Uchida lists various improvements and advantages attending from the strictly chromium composition of intervening layer 2, most notably the adhesion properties of layer 2 with respect to both the underlying steel and the overlying chromate layer. (Col. 8, line 45 to Col. 9, line 10). In view of these advantages of layer 2 based on its strictly chromium composition, and the express desire of Uchida to relocate the chromate film 3 (e.g., an oxide) away from the steel plate surface, Applicant submits that one skilled in the art would be led away from the modification proposed by the Examiner (i.e., oxidation of layer 2), much less find it obvious to make the proposed modification. At best, an impermissible obvious to try rationale would have to be employed to combine the prior art teachings in the proposed manner.

Applicant believes that the application is now in condition for allowance and respectfully requests favorable action in accordance therewith.

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If the Examiner has any questions or comments that would advance prosecution of this case, the Examiner is invited to call the undersigned at 260/484-4526.

Respectfully Submitted,



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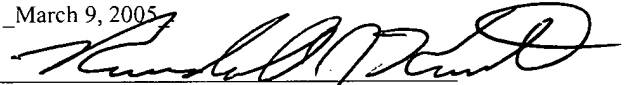
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Enclosures: Amendments to the Claims
(2 Sheets)
Explanatory Cover Sheet - Page 1
RCE
Petition for Extension of Time
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450, on: March 9, 2005



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Date